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Iniiative to Insure Safe Foods,
U S Department of Agriculture,
FSIS Hearing Clerk,
300 12th st. S.W.
Rm. 102,
Washington D.C. 202503700
Docket # 98-045N

Dear Sir:

This comment refers to the NAS Committee to Ensure Safe Food Report of 1998 and specifically to portions dealing with food born bacterial diseases.

We call your attention to new break through products for sanitizing meats in the processing plants and to their impact on inspection requirements, regulatory limits for bacterial contamination and consumer handling of meat products.

There now exists safe, FDA approved antibacterial solutions for use on meat products which have extreme ability to reduce bacterial contamination.

One such product was reported at the July 28, 1998 FSIS Symposium on "Technologies for Reducing Pathogens" (a copy enclosed).

As can be seen the chicken carcasses were reduced zero bacterial counts.

Current USDA regulations allow up to 200,000 bacteria per chicken carcass. We comment this high contamination level can and should be reduced. We believe that inclusion of retail consumer information (Box ES 1)to lay public about safe handling of contaminated meats will yield little results because of the difficulties fully cleansing hands, utensils, clothing and surfaces once the pathogens are in the home. Best results will come from the new and more effective technology.

We comment that this new technology should be supported with research grants in an expedited manner to any University or competent research institution interested in pursuing adoption to actual plant production lines. Current Federal Grant procedures take 14 to 18 months just to get the finding. This is so important that grant and researce contract review procedures should should be expidited. That the increased monitoring and inspections in visioned in (Box ES 3) are not needed once the new technology is in use.

I trust that this is of some help to you.

Sincerely,

Richard Norton

ABSTRACT

A COMPARISON OF THREE NOVEL SANITIZING SOLUTIONS TO ERADICATE ENTERIC PATHOGENS FROM POULTRY

Presenter: Richard Norton, President, DN Consultants, Rockville, Md, 20850

This study evaluated the antimicrobial effects of three unique sanitizing solutions for treating poultry carcasses relative to untreated control carcasses from the same source. The carcasses were taken directly from a processing plant production line. This is the sixth and most promising pilot study performed over a nine year period.

All three treatments reduced the *E.Coli* and total coliform bacterial counts to zero, as compared to untreated carcass average counts of 42,628 *E.Coli* and 43,542 coliform bacteria.

Treatments "A" and "B" each reduced the total plate count to zero on four out of the six chicken carcasses, while treatment "C" reduced the total plate count to zero on all six carcasses. By comparison, the control untreated chicken carcasses had an average total bacterial colony count of 866,857 / carcass.

In the method employed, twenty five chicken carcasses were removed from a processing plant production line after exiting the Inside-Out Bird Washer en route to the chiller tank. Seven carcasses, as untreated controls, were immediately placed in a five gallon bucket of ice water to simulate a chill tank rinse. The remaining carcasses were divided into treatments "A", "B" and "C" with six carcasses in each treatment group. Carcasses to be treated were immersed in the appropriate sanitizing solution for thirty seconds and then transferred to a five gallon bucket of ice water to simulate a chill tank rinse. Cultures were obtained by the whole carcass bird rinse using 400 ml. of sterile Buffered Peptone Water. Cultures were performed for Total Plate Count, for coliform bacteria, and for *E. Coli.*

The carcasses were carefully examined. Organoleptic changes were found to be nil.

The lowest concentration of solution "C" capable of reducing the Total Plate Count to Zero on all carcasses has not yet been determined.

Additional pilot studies of modifications to solutions "B" and "C" are in progress.

These novel solutions offer unique antimicrobial treatments to dramatically reduce enteric pathogens and the total bacterial load on chicken carcasses.

ERADICATION OF BACTERIA AND ENTERIC PATHOGENS ON POULTRY CARCASSES

Chicken carcasses continue to be contaminated with enteric pathogens responsible for human morbidity and mortality. More effective process control would minimize pathogen contamination and control other health hazards.

In the present study, three sanitizing solutions were evaluated for efficacy in eradicating enteric pathogens from chicken carcasses as compared to untreated control carcasses. The microbial flora of the control carcasses were representative of a production line but were higher than that of a plants final product because they were taken before immersion in the chiller tank containing its antimicrobial. This was solely a study of the test solutions on the normal microbial flora of chicken carcases with out interferences so it was necessary to remove the carcasses before immersion in the chiller tank.

In vitro testing with the active ingredients had revealed that they produce a seven log kill against ***Staphylococcus aureus*** and ***E. Coli*** within thirty seconds in the A. O.A.C. sanitizer test required by the EPA. Thus, it was thought that the products might have efficacy against contaminating flora and enteric pathogens on chickens. To test this hypothesis the following study was done.

MATERIALS AND METHODS

Twenty five chicken carcasses were collected from a local chicken processing plant. The carcasses were removed from the processing line after exiting the Inside-Outside Bird Washer and prior to entering the chiller tank. The chicken carcasses were transported, at ambient temperature, to the site of treatment which was approximately ten minutes from the processing facility. Three unique novel sanitizing solutions were formulated in advance of the treatment trial. Three "base" solutions ("A", "B", and "C") were prepared each totaling 3,950 ml.. Immediately prior to immersing the chicken carcasses in the sanitizing solutions, fifty ml. of the active ingredient was added to each of the base solutions and stirred briefly, to ensure adequate mixing. Thus, the total sanitizing treatment volume for each chicken carcass was 4,000 ml.. Six chicken carcasses were immersed in solution "A", six chicken carcasses were immersed in solution '73", and six carcasses were immersed in solution "C".

Each carcass was immersed for a total of thirty seconds. After removal from the sanitizing solutions, the carcass was allowed to hang for a few moments to allow any excess solution to drip away. Next, the carcass was placed in a five gallon container (with a sterile plastic liner supplied by the poultry producer) containing two and half gallons of potable water and five pounds of ice. The chicken carcasses were allowed to remain in this ice water for a total of forty five minutes to simulate immersion in a chiller tank.

After removal from the ice water rinse solution, the chicken carcasses were placed in a sterile plastic bag supplied by the producer in preparation for the whole bird carcass rinse. Any excess water was poured out of the bag prior to adding 400 ml. of sterile Buffered Peptone Water. The top of the bag was sealed by twisting the base. The chicken carcasses were moved in a ninety degree arc at the rate of one rotation per second for a total of sixty seconds. Meticulous care was taken to ensure that the culture solution contacted the entire surface of the chicken carcass, including the body cavity. The entire 400 ml. of culture liquid was returned to a sterile, plastic container that was labeled as to the treatment group and number, *i.e.*, "A"1-6, "B" 1-6, and "C" 1-6.

Seven carcasses did not undergo any treatment and represent the control group. These carcasses were placed in a five gallon container of ice water to simulate a chiller tank. After 45 minutes of immersion these carcasses were cultured with the whole bird carcass rinse solution identical to that used for the treated carcasses. The culture bottles were labeled "D" 1-7.

The twenty five culture bottles were placed in a styrofoam box with ten pounds of ice to keep the cultures cool but not frozen. The cultures were taken to a poultry producers primary quality assurance laboratory, The carcasses were treated and cultured on the same day. Microbial culturing and plate counting for each carcass were performed by experienced microbiologists for Total Plate Count, coliform and *E. Co/i* using standard microbiology procedures approved by USDA.

To obtain the number of bacteria per carcass the number of bacteria per ml. was multiplied by the volume of the rinse solution, in this case, 400. For the control carcasses the counts reported were the average of the seven individual carcass counts.

The carcasses were inspected for organoleptic changes post treatment,

RESULTS

Among the seven control carcasses, the average bacteria plate counts per carcass were: 866,657 for Total Plate Count; 43,542 for coliform organisms, and 42,628 for *E. Coli* bacteria.

All three sanitizing solutions, "A", "B", and "C", produced both coliform and *E. Coli* counts of zero.

In each treatment group "A", and "B", the Total Plate Count for four out of the six carcasses was zero.

In treatment group "C", the Total Plate Count for six out of the six carcasses was zero.

The active ingredients produced no detectable organoleptic changes. Their residues on the carcasses are recognized by the Food and Drug Administration (FDA) as safe in foods.

DISCUSSION

A plethora of solutions have been tried to eradicate enteric pathogens from poultry carcasses. To date the only known method of reducing bacterial levels to zero is irradiation. The poultry industry is reluctant to irradiate their product because of perceived unacceptance by their customers.

This is the first time known to this investigator, the cooperating poultry producer, in the scientific literature, or the patent literature that zero Total Plate Counts, zero coliform counts and zero ***E. Coli*** counts on poultry carcasses has been achieved with sanitizing solutions in thirty seconds without organoleptic changes.

Novel solutions and chemistry are needed to eradicate enteric pathogens and colonizing flora from poultry carcasses. Improved antimicrobial treatment will significantly reduce the risk to processors that chickens with food safety defects will inter commerce and thus expensive and damaging product recalls will be avoided. It could greatly reduce the morbidity, mortality and health care costs associated with inadvertent ingestion of food born pathogens. It would impact all microorganisms, including those responsible for decomposition, resulting in improved quality and longer shelf life.

Should any of the active ingredients in the novel sanitizing solutions leave active residues on the chicken carcass, they are GRAS (Generally Recognized as safe by the FDA). Any such residue would produce an additional antimicrobial effect that remains on the poultry during storage and transportation. The FDA has stated that they offer no objections to performing further trials with these ingredients as long as the trials is under the supervision of the USDA.

This research raises interesting questions. The optimal method of using these sanitizer is still unknown. Would a higher concentration work in a shorter time? If used in an immersion tank, how often would the active ingredients have to be added in order to ensure adequate levels of sanitizer? Would the product work with a spray application? If so what is the time needed for a spray to be effective? Would the product be effective on beef, pork, and turkey carcasses? What is the environmental impact of the novel sanitizer? Are there personnel hazards associated with the product for the meat and poultry industry? What benefits will these sanitizers provide for product quality and shelf life storage?

It is hoped that this research and this novel product will generate new energy and interest in the idea that there are methods and antimicrobial agents available for reducing the current level of enteric pathogens and colonizing flora on our nations meat and poultry products.

MICROBIAL COUNTS PER MILLILITER OF WASH

SAMPLE	TOTAL PLATE COUNT	COLIFORMS	E. COLI
		SOLUTION A	
A-I	o	0	0
A-2	0	0	0
A-3	740	0	0
A-4	1	0	0
A-5	0	0	0
A-6	0	0	0
		SOLUTION B	
B-I	3	0	0
B-2	0	0	0
B-3	0	0	0
B-4	0	0	0
B-5	0	0	0
B-6	260	0	0
		SOLUTION C	
C-1	o	0	0
C-2	0	0	0
C-3	0	0	0
C-4	0	0	0
c-5	0	0	0
C-6	0	0	0
		UNTREATED CONTROL	
D-1	.100	2	2
D-2	1 2,600	720	710
D-3	150	3	2
D-4	830	25	*22*
D-5	410	6	*6*
D-6	790	3	*2*
D-7	290	3	0
AVERAGE	2,167	108	106
x 400 ml.	*866,$57*	*43,542*	42,514